

U.S. Patent Application Serial No. 09/664,332
Response filed August 19, 2004
Reply to OA dated **May 28, 2004**

REMARKS

Claims 1-3, 6-10, 12, 17-19 and 21-28 are pending in this application. Applicant believes that claims 9, 17-19 and 23-26 are withdrawn from consideration. No amendment is proposed in this response. It is believed that this Response is fully responsive to the Office Action dated **May 28, 2004**.

Regarding disposition of claims (box 4(a)) in the Office Action Summary.

Applicant respectfully notes that claim 28 is again listed as withdrawn from consideration. Applicant noted to the Examiner in the Response dated May 13, 2004, that this appeared to be an error, and Applicant again submits that this listing is an error. Applicant notes that claim 28 is rejected in the Office action.

Claims 1-3, 6-8, 10, 12, 22, 27 and 28 are rejected under 35 U.S.C. §103(a) as being unpatentable over Hamazu et al. (Patent No. 5,359,017), Buchwalter et al. (Patent No. 5,879,859, Starkey (Patent No. 5,384,339) and Green (Patent No. 4,252,592 in view of Green et al. (Patent No. 4,299,938). (Office action paragraphs no. 1-7)

Reconsideration of the rejection is respectfully requested.

In traversing the rejection, Applicant notes that independent claim 1 requires a curing agent component comprising an acid anhydride or derivative, and a photopolymerization initiator component of formula (IV), (IV') or (V). That is, the photopolymerization initiator component of

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the present invention (which is specified by the structural formula (IV), (IV') or (V)) expresses chain curing **in combination with an acid anhydride**. The curing by chain reaction is made possible by the resin composition in which the specified amount of acid anhydride and the specific amount of the compound specified by the structural formula (IV), (IV') or (V) are mixed together. Applicant submits that this combination is different from the conventional photo curing and heat curing of the cited art. Accordingly, the composition of the present invention makes it possible to cure by chain reaction, which is a different mechanism than in the cited references.

Hamazu (U.S. Patent No. 5,359,017) discloses that the composition which comprises the photopolymerization initiator component may optionally be mixed together with one or more auxiliaries such as antistatic agents, surfactants, and acid anhydrides (column 5, lines 11-14). This is clearly not a suggestion for a component allowing curing by chain reaction, since chain curing is not made possible by antistatic agents, surfactants or the like. Regarding the acid anhydride, Hamazu merely discloses that acid anhydride may be optionally mixed together as an “auxiliary,” without any particular stated function. Applicant notes that acid anhydride is not used in any of Hamazu’s Examples.

Hamazu does not suggest at all what characteristics are provided by adding “acid anhydride” to the composition. Clearly, adding acid anhydride in order to cure by chain reaction, i.e., “in order to rapidly cure at a depth where no light reaches,” is never disclosed or suggested by Hamazu. Rather, the invention of Hamazu relates to adding the stabilizer shown in Table 1 so that the cationic polymerization catalyst also shown in Table 1 can be stably preserved. In other words, the object

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of the invention of Hamazu is to provide a composition in which no reaction occurs in its stable preservation, which is completely different from that of the present invention in which the curing by chain reaction is possible. Thus, the mention of “acid anhydride” as an auxiliary provides no motivation for the “makes it possible to cure by chain reaction” recitation of claim 1.

In contrast, the present invention relates to a composition which makes it possible to cure by chain reaction in photo curing. In the present invention, “acid anhydride” is part of the composition as an essential component, since curing by chain reaction itself cannot be achieved without the “acid anhydride.” Moreover, the amount ratio of the acid anhydride is limited in claim 1 to 0.3 - 1.4 mol with respect to 1 mol of the resin component. There is no suggestion for this limitation in Hamazu.

Applicant notes that in a composition comprising **only** the specific sulfonium salt of the formula (IV), (IV') or (V), chain curing does not occur. In order to generate chain curing, co-existence of both the specific sulfonium salt and an acid anhydride is necessary. Applicant again asserts that **none of the cited references suggests this combination.**

Accordingly, none of the cited references suggests the specific amount of acid anhydride in the range of 0.3 - 1.4 mol with respect to 1 mol of the resin component, which is related to its function in chain curing in the present invention. Moreover, none of the cited references suggests the proportion of 0.1 - 6.0 parts by weight of the photopolymerization initiator per 100 parts of the other components of the resin composition (as recited in claim 1), which is also related to the function of allowing chain curing.

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Applicant has argued above that the cited references fail to suggest the specific limitations of claim 1. Applicant further asserts that the functional effect of the present invention of achieving chain curing is not disclosed or suggested in the cited references and that this effect is completely unexpected over the references.

In the conventional energy-ray curing shown in the cited references, although curing of a resin component itself proceeds by a photopolymerization initiator, curing does **not** proceed at depths where no light reaches or where no light exists. Applicant submits that no combination of the references suggests achieving chain curing, and curing cannot be performed at a depth where no light reaches in just a few minutes unless chain curing is achieved. In addition, the heat curing described in the references requires a heating device and a heating step (for a certain amount of time), and there is no suggestion for curing in a short time with a simplified device as used in energy-ray curing as in the present invention.

Applicant therefore submits that claims 1-3, 6-8, 10, 12, 22, 27 and 28 are non-obvious over Hamazu et al. (Patent No. 5,359,017), Buchwalter et al. (Patent No. 5,879,859, Starkey (Patent No. 5,384,339), Green (Patent No. 4,252,592, and Green et al. (Patent No. 4,299,938), taken separately or in combination.

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If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact Applicant's undersigned agent at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed, Applicant respectfully petitions for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

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